TEST REQUEST FORM

Sample/Specimen No. 0-001 Cost Code/Work Order No. ED 332

Requested By: Org. 80232 Person J. LINDBERG Date 1-16-89

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
MOISTURE	1	ETAL-14
HYDROMETER	1	ETAL-07 (CF REQ)

Remarks FIELD SAMPLE MW 9-1

Received By: R.G ALEXANDER Date 1-9-90

Approved By: R.G ALEXANDER Date 1-16-90

SIEVE ANALYSIS DATA SHEET

Sample ID D-001 Page 1 of 1

Tested By R.G. ALEXANDER Date 1-16-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3504	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B}$ x 100 = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	3 1/2	4746.00	0	0	0	100	100
	3		789.40	16.6	16.6	83.4	83.4
	2 1/2		0				↓
	2		0				83.4
	1		988.55	20.8	Rev 368 79.2	79.2	79.2
	3/4		1211.52	25.5	25.5	74.5	74.5
	1/2		1510.57	31.8	31.8	68.2	68.2
	3/8		1712.90	36.1	36.1	63.9	63.9
	#4	↓	2140.86	45.1	45.1	54.9	54.9
	#10	4746.00	2400.91	50.6	50.6	49.4	49.4
	#40	145.53	46.27	31.8	31.8	68.2	33.7
	#60		69.62	47.8	47.8	52.2	25.8
	#100		85.15	58.5	58.5	41.5	20.5
↓	#200	↓	102.78	70.6	70.6	29.4	14.5

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 29.4 %

D=Original Dry Weight of Sample 145.53 g

E=Dry Weight of Sample After Washing/Sieve 102.78 g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING

SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

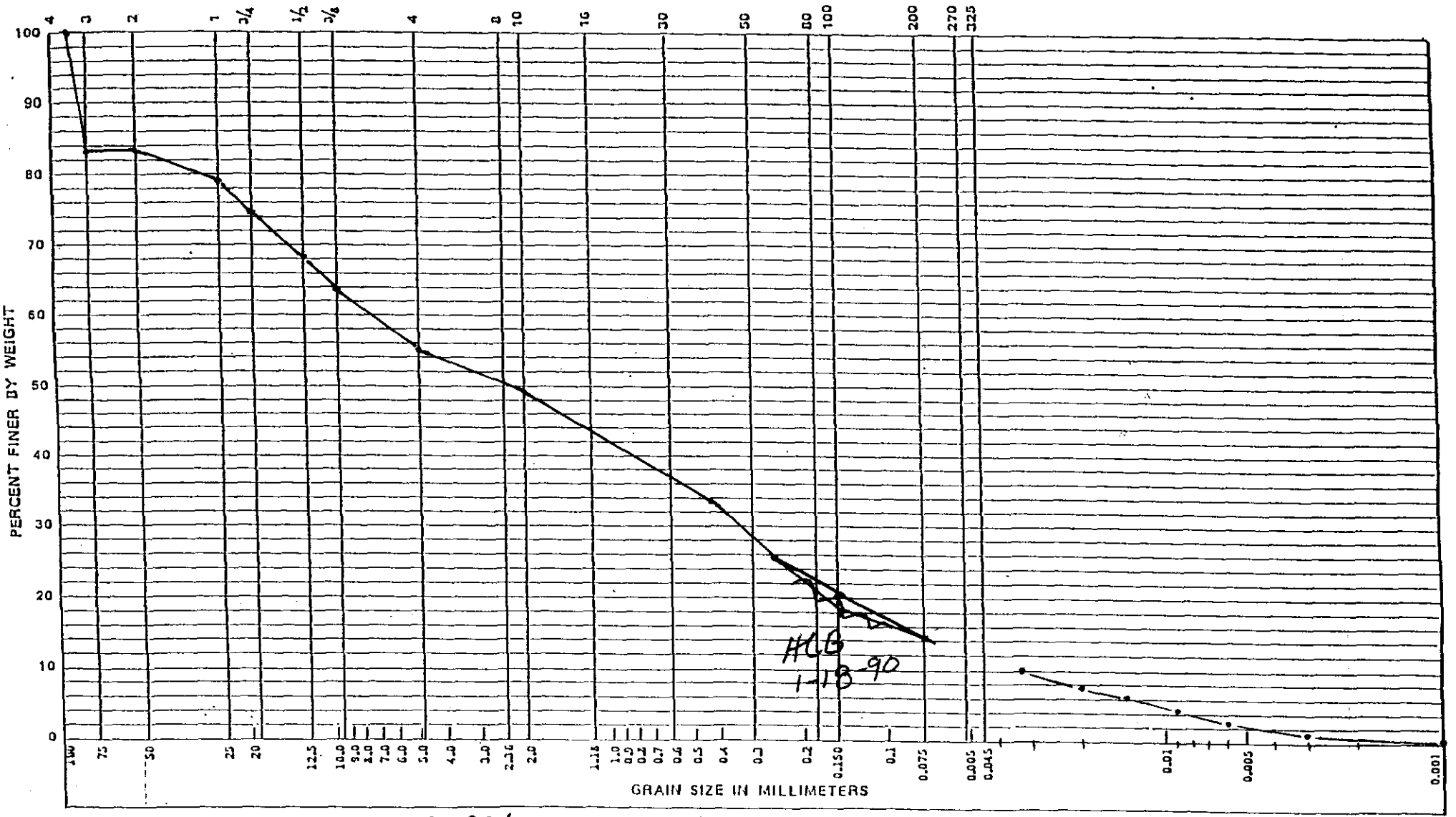
Checked By H L Benny Date 1-18-90

A-8400-204(2-87)

9212-1-94

9212 1095

GRAIN SIZE ANALYSIS PLOT



Specimen No. D-001 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL MW-9-1

Plotted by: R.G. ALEXANDER Date: 1-16-90

Checked by: HCBenny Date: 1-18-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-001	5475.29	5330.72	584.72	4890.57	4746.00	3.05

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G ALEXANDER DATE 1-16-90

SPECIFIC GRAVITY OF SOILS DATA SHEET

Specimen/Sample No. 0-001 Page 1 of 1

Test Operator R.G. ALEXANDER 3-5-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-26-90
Oven Thermometer	0007	8-16-90
Thermometer	0002	2-9-91
Pycnometer	2554	N/A

Wetting Agent "Q" WATER

	DETERMINATION NO.	1	2	3
	Drying Container No.	N/A	N/A	N/A
	Wt. Container + Oven Dry Soil, ± 0.01g	N/A .__	.__	.__
	Wt. Container, ± 0.01g	N/A .__	.__	.__
W_o	Wt. Oven Dry Soil, g	40.00	.__	.__
	Pycnometer No.	2554		
	Wt. Pycnometer, g	135.72	.__	.__
W_a	Wt. Pycnometer + Wetting Agent, g	387.11	.__	.__
W_b	Wt. Pycnometer + Wetting Agent + Soil, g	412.60	.__	.__
	Temperature, T_x at W_b, °C	24.4	.	.
G_w	Specific Gravity of Wetting Agent at T_x	1.00	_.__	_.__
G_t	Specific Gravity of Soil at T_x	2.76	_.__	_.__
G_s	Specific Gravity of Soil at 20°C	2.75	_.__	_.__

$$G_t = \frac{G_w \cdot \gamma_w \cdot W_o}{W_o + (W_a - W_b)}$$

γ_w = Unit Weight Of Water (g/cc)

*$G_s = K \cdot G_t$

K values found in ASTM D854-58, Table 1

*NOTE $G_s = G_t$ When Test Run at 20 °c

Average Specific Gravity At 20°c	2.75

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HC Barney Date 3-7-90

A-6400-235 (9-86)

HYDROMETER ANALYSIS DATA SHEET

Sample ID 0-001 Page 1 of 1

Tested By H L Benny Date 3-8-90

Procedure ETAL 07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	NO.	CALIBRATION DUE DATE
Hydrometer	1000	2-16-91
Balance	3304	3-25-90
Thermometer/Thermocouple	0002	2-9-91

Specific gravity of Sample 2.75

% Passing No. 10 Sieve 49.4 (%)

Hygroscopic Correction Factor Ø

WEIGHT OF SAMPLE

Wt. Container + Soil NA (g)

Wt. Container NA (g)

Wt. Soil 100.38 (g)

COMPOSITE CORRECTION

1st Reading 7 at 24.2 °C

2nd Reading NA at NA °C

HYGROSCOPIC MOISTURE CONTENT

Wt. Container + Air Dry Soil NA (g)

Wt. Container + Oven Dry Soil NA (g)

Wt. Container NA (g)

Water Content NA (%)

REMARKS

Tube C

W= 203.20

Date	Clock time	Elapsed time (min)	Hydrometer reading	Hydrometer with composite correction	Temp. (°C)	Soil in suspension (%)	Particle diameter (mm)
3-8-90	0846	2.0	28	21	22.7	10.1	0.031
	0849	5.0	23	16	22.7	7.7	0.023 ~~0.028~~ RGA 3-14-90
	0869	15.0	20	13	22.5	6.2	0.012
	0914	30.0	17	10	22.4	4.8	0.009
	0944	60.0	13	6	22.0	2.9	0.006
↓	1254	250.00	10	3	22.0	1.4	0.003
3-9-90	0844	1,440.0	8	1	22.4	0.5	0.001

Formulas and Tables used to calculate percent Soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By R.G Alexander Date 3-14-90

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: Jon Lindberg Telephone: 6-5005

Sample Collected by: K.M. Singleton Date: 1-3&4-90 Time: NA

Sample Locations: Horn Rapids LANDFILL, MW 9

Ice Chest No.: NA Field Logbook Page No.: _____

Remarks: Test Requested: Grain Size & moisture test & Hydrometer

Method of Shipment: CAR/TRUCK to 2101-M

Sample Identification

MW 9-1, ~7 lbs of soil in plastic bag
~~moisture~~
Jes 1-4-90

MW 9-2, ~ 10 lbs of soil
in plastic bag

MW 9-3, ~ 6 lbs of soil
in plastic bag

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
~~K.M. Singleton~~ K.M. Singleton	R.G. ALEXANDER	1-9-90/0630
Relinquished by:	Received by: RE Alexander	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9216066

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-3E4-90 Time: NA hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW9-1	1 plastic bag of soil	soil	Moisture / Sieve / Hydrometer
MW9-2	1 plastic bag	soil	Moisture / Sieve / Hydrometer
MW-9-3	1 plastic bag	soil	Moisture / Sieve / Hydrometer

Field Information **

Special Handling and/or Storage

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. Mw-9 Date 1-4-90

Released By [signature]

Operational Health Physics

Remarks

MW-9-1

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By [signature]

Operational Health Physics

Remarks

MW-9-2

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By [signature]

Operational Health Physics

Remarks

MW-9-3

54-3000-022 (09/88)

TEST REQUEST FORM

Sample/Specimen No. 0-002 Cost Code/Work Order No. ED 332

Requested By: Org. 80232 Person J. LINDBERG Date 1-16-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
MOISTURE	1	ETAL-14
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-9-2

Received By: R.G ALEXANDER Date 1-9-90

Approved By: R.G ALEXANDER Date 1-16-90

9211-1-002

SIEVE ANALYSIS DATA SHEET

Sample ID 0-002 Page 1 of 1

Tested By R.G. ALEXANDER Date 1-16-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B}$ X 100 = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2	4826.06	0	0	0	100	100
	1 1/2		127.69	2.6	2.6	97.4	97.4
	1		592.47	12.3	12.3	87.7	87.7
	3/4		1354.06	28.1	28.1	71.9	71.9
	1/2		1925.54	39.9	39.9	60.1	60.1
	3/8		2216.56	45.9	45.9	54.1	54.1
	#4		2565.56	53.2	53.2	46.8	46.8
	#10	4826.06	2844.42	58.9	58.9	41.1	41.1
	#40	110.66	33.31	30.1	30.1	69.9	28.7
	#60		65.46	59.3	59.3	40.7	16.7
	#100		77.58	70.1	70.1	29.9	12.3
	#200		87.77	79.3	79.3	20.7	8.5

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 20.7 %

D=Original Dry Weight of Sample 110.66 g

E=Dry Weight of Sample After Washing/Sieve 87.77 g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

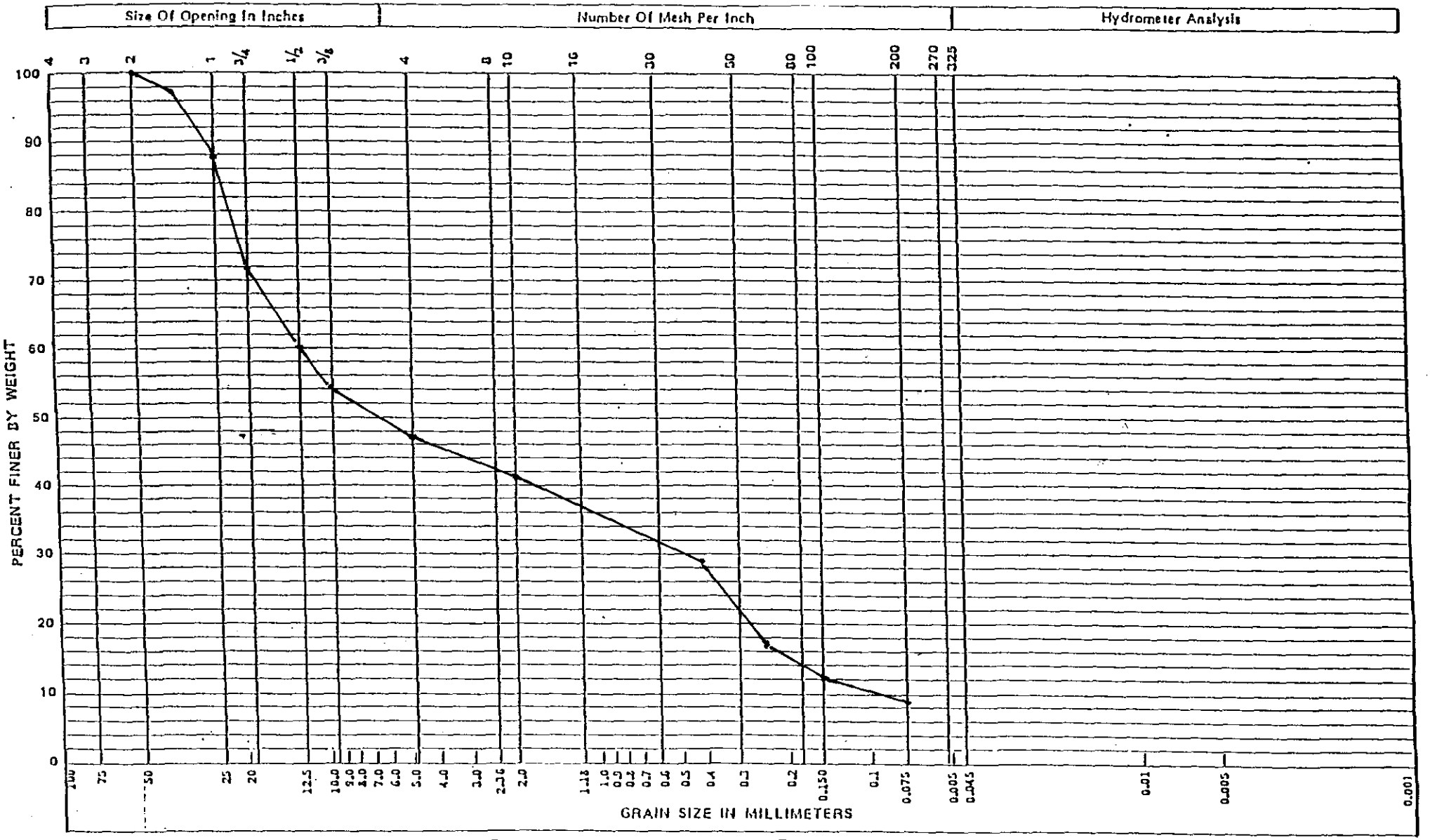
Checked By H L Benny Date 1-18-90

A-8400-204(2-87)

9212003

9 2 1 2 1 0 0 4

GRAIN SIZE ANALYSIS PLOT



Specimen No. O-002 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL MW-9-2	Plotted by: RG. ALEXANDER Date: 1-16-90	Checked by: HL Benny Date: 1-18-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. 0

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-002	5483.71	5404.12	578.06	4905.65	4826.06	1.65

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G ALEXANDER DATE 1-16-90

9210105

Westinghouse Hanford Company

CHAIN OF CUSTODY

Company Contact: Jon Lindberg Telephone: 6-5005

Sample Collected by: K.M. Singleton Date: 1-3 & 4-90 Time: NA

Sample Locations: Horn Rapids LANDFILL, MW 9

Ice Chest No.: NA Field Logbook Page No.: _____

Remarks: Test Requested: Grain Size & moisture test & Hydrometer

Method of Shipment: CAR/TRUCK to 2101-M

Sample Identification

MW 9-1, ~7 lbs of soil in plastic bag

~~moisture~~
Test 1-4-90

MW 9-2, ~ 10 lbs of soil in plastic bag

MW 9-3, ~ 6 lbs of soil in plastic bag

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
~~K.M. Singleton~~ K.M. Singleton	R.G. ALEXANDER	1-9-90 / 0630
Relinquished by:	Received by: RE Alexander	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9212105

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-3E4-90 Time: N/A hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW9-1	1 plastic bag of soil	soil	Moisture/Sieve/Hydrometer
MW9-2	1 plastic bag	soil	Moisture/Sieve/Hydrometer
MW-9-3	1 plastic bag	soil	Moisture/Sieve/Hydrometer

Field Information **

Special Handling and/or Storage

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By _____
Operational Health Physics

Remarks MW-9-1

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By _____
Operational Health Physics

Remarks MW-9-2

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By _____
Operational Health Physics

Remarks MW-9-3

54-3000-022 (09/88)

TEST REQUEST FORM

Sample/Specimen No. 0-003 Cost Code/Work Order No. ED-332

Requested By: Org. 80232 Person J. LINDBERG Date 1-16-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
MOISTURE	1	ETAL-14
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-9-3

Received By: RG ALEXANDER Date 1-9-90

Approved By: RG ALEXANDER Date 1-16-90

9212170009

SIEVE ANALYSIS DATA SHEET

Sample ID 0-003 Page 1 of 1

Tested By RG ALEXANDER Date 1-16-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

BEFORE TEST WT (B) N/A AFTER TEST WT. (A) N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2	3930.37	∅	∅	∅	100	100
	1½		∅	∅	∅	100	100
	1		474.62	12.1	12.1	87.9	87.9
	¾		603.00	15.3	15.3	84.7	84.7
	½		695.31	17.7	17.7	82.3	82.3
	⅜		747.82	19.0	19.0	81.0	81.0
	#4		841.04	21.4	21.4	78.6	78.6
	#10	3930.37	912.14	23.2	23.2	76.8	76.8
	#40	115.31	33.42	29.0	29.0	71.0	54.5
	#60		81.21	70.4	70.4	29.6	22.7
	#100		98.82	85.7	85.7	14.8	11.0
	#200		107.03	92.8	92.8	7.2	5.5

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 7.2 %

D=Original Dry Weight of Sample 115.31 g

E=Dry Weight of Sample After Washing/Sieve 107.03 g

C = <(D-E)/D> X 100

Remarks
WASH FINE GRADING
SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

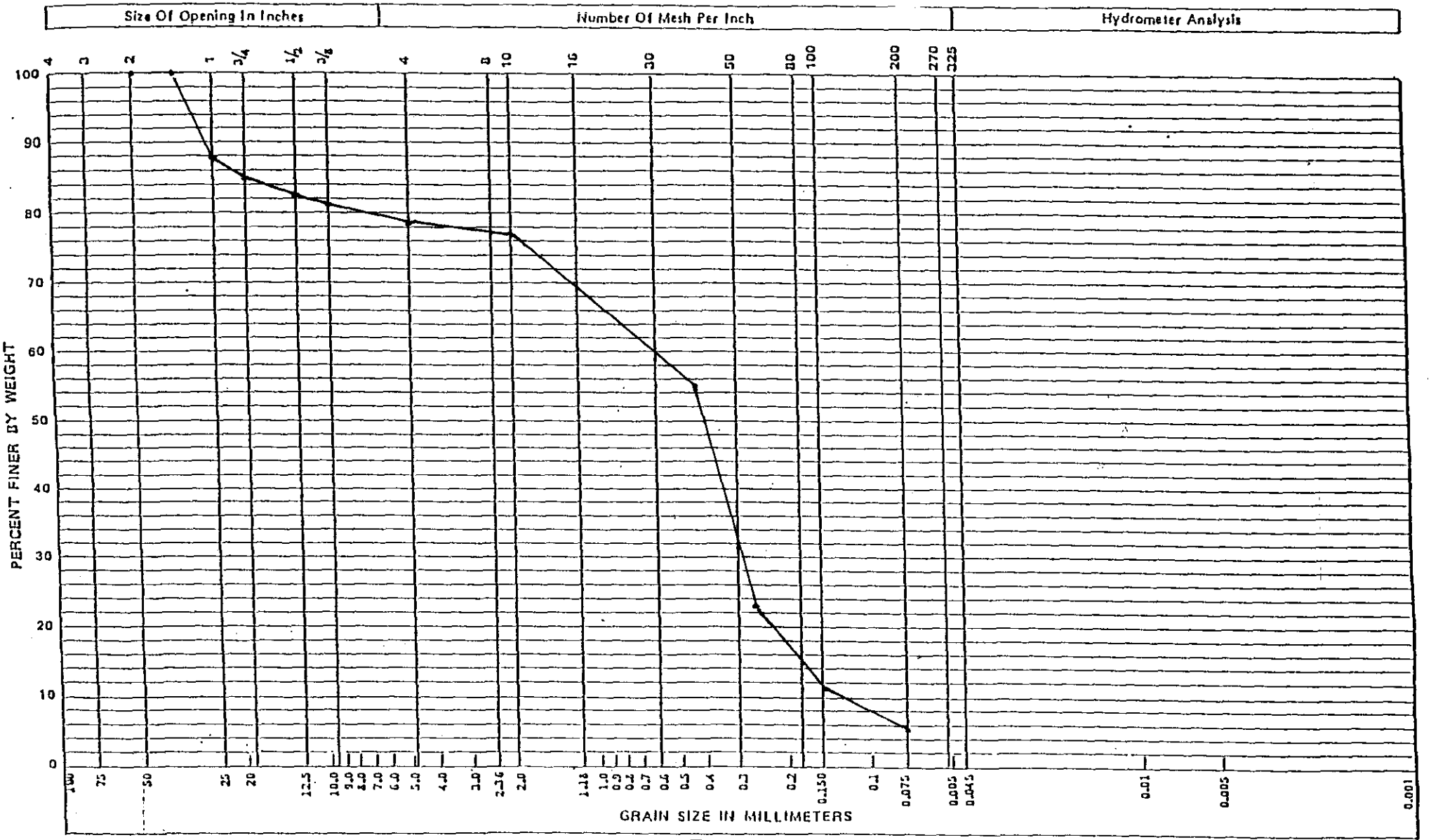
Checked By HL Benny Date 1-18-90

A-6400-204(2-87)

9211010

9 2 1 2 1 0 1 1

GRAIN SIZE ANALYSIS PLOT



Specimen No. O-003 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL MW-9-3

Plotted by: R.G ALEXANDER Date: 1-16-90

Checked by: H.L Benny Date: 1-18-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. 0

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-003	4631.04	4519.76	589.39	4041.65	3930.37	2.83

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 1-16-90

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: Jon Lindberg Telephone: 6-5005

Sample Collected by: K.M. Singleton Date: 1-3 & 4-90 Time: NA

Sample Locations: Horn Rapids LANDFILL, MW 9

Ice Chest No.: NA Field Logbook Page No.:

Remarks: Test Requested: Grain Size & moisture test & Hydrometer

Method of Shipment: Car/Truck To 2101-M

Sample Identification

MW 9-1, ~7 lbs of soil in plastic bag
~~moisture~~
RG 1-4-90

MW 9-2, ~ 10 lbs of soil in plastic bag

MW 9-3, ~ 6 lbs of soil in plastic bag

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
~~K.M. Singleton~~ K.M. Wright	R.G. ALEXANDER	1-9-90 / 0630
Relinquished by:	Received by: RE Alexander	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9212103

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-3E4-90 Time: N/A hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW9-1	1 plastic bag of soil	soil	Moisture/Sieve/Hydrometer
MW9-2	1 plastic bag	soil	Moisture/Sieve/Hydrometer
MW-9-3	1 plastic bag	soil	Moisture/Sieve/Hydrometer

Field Information **

Special Handling and/or Storage

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By _____
Operational Health Physics

Remarks MW-9-1

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By _____
Operational Health Physics

Remarks MW-9-2

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9 Date 1-4-89

Released By _____
Operational Health Physics

Remarks MW-9-3

54-3000-022 (09/88)

TEST REQUEST FORM

Sample/Specimen No. 0-044 Cost Code/Work Order No. ED332

Requested By: Org. 80232 Person J. LINDBERG Date 1-31-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
N/A	N/A	N/A
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-9-4

Received By: RG ALEXANDER Date 1-23-90

Approved By: R.G ALEXANDER Date 1-31-90

SIEVE ANALYSIS DATA SHEET

Sample ID D-044 Page 1 of 1

Tested By R.G. ALEXANDER Date 1-31-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)
BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B}$ X 100 = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2"	4579.91	0	0	0	100	100
	1½		109.93	2.4	2.4	97.6	97.6
	1		642.66	14.0	14.0	86.0	86.0
	¾		956.13	20.9	20.9	79.1	79.1
	½		1317.16	28.8	28.8	71.2	71.2
	⅜		1567.86	34.2	34.2	65.8	65.8
	#4		2131.88	46.6	46.5	53.5	53.5
	#10	4579.91	3017.70	65.9	65.9	34.1	34.1
	#40	157.17	80.93	51.5	51.6	48.5	16.5
	#60		116.66	74.2	74.2	25.8	8.8
	#100		134.00	85.3	85.3	14.7	5.0
	#200		142.49	91.3	91.3	8.7	3.0

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 8.7 %

D=Original Dry Weight of Sample 157.17 g

E=Dry Weight of Sample After Washing/Sieve 143.49 g

C = <(D-E)/D> X 100

Remarks
WASH FINE GRADING
SMALL FIELD
SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

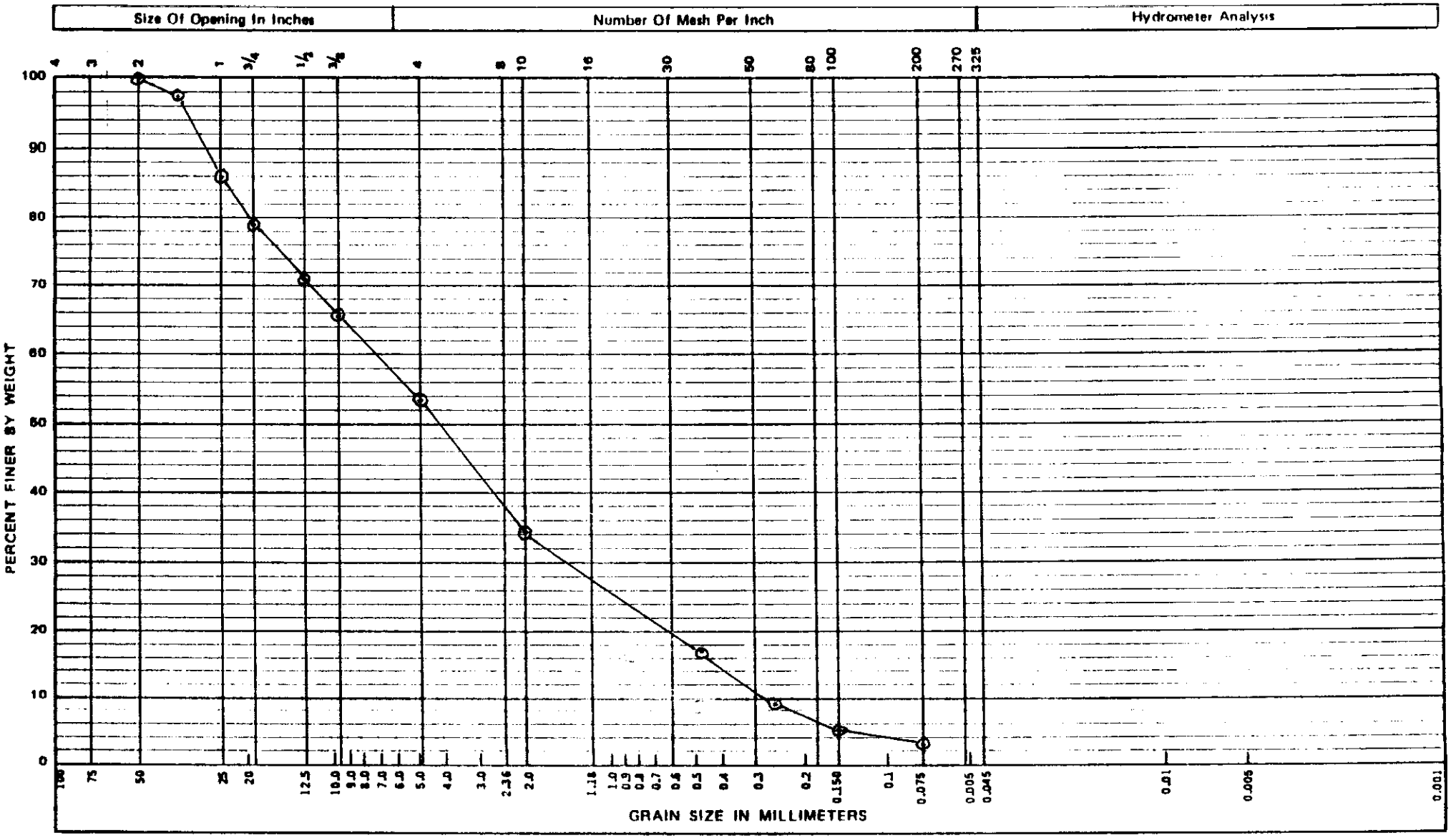
Checked By H. Benny Date 2/2/90

A-6400-204(2-87)

9211217

9212 1013

GRAIN SIZE ANALYSIS PLOT



Specimen No O-044 Procedure No ETAL-07 Rev 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL MW-9-4

Plotted by: R.G ALEXANDER Date: 2-1-90

Checked by: HC Benny Date: 2-2-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. 0

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-044	5514.81	5168.39	588.48	4926.33	4579.91	7.56

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 1-31-90

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: JW Lindberg Telephone 6-5005

Sample Collected by: Steve Anderson Date: Jan 5-6, 1990 Time: NA

Sample Locations: Temp. Well No. MW-9

Ice Chest No.: NA Field Logbook & Page No.: NA

Remarks: CERCLA 1100-EM-1 Operable Unit, Groundwater Monitoring Well, south-west side of Horn Rapids Landfill

Bill of Lading No.: NA Off Site Property No.: NA

Method of Shipment: Hand Carry

Shipped to: Jerry Alexander

Sample Identification	
~~MW-4~~ JWL 1-9-90	
→ JWL 1-9-90	
MW-9-4 below ▽	
MW-9-5 " "	
MW-9-6 " "	

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
Steve Anderson (STEVE L ANDERSON)	JW Lindberg	Jan 9, 1990; 11:15
JW Lindberg JW Lindberg	RG Alexander R.G. ALEXANDER	1-28-90/0605

FVR\071889-2

9210200

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: Steve Anderson (Golder Assoc.) Date Sampled: Jan 5-19, 1990 Time: NA hours

Company Contact JW Lindberg Telephone (206) 376-8005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-9-4	double-lined plastic bags	Soil	Particle Size
MW-9-5	" " " "	Soil	Particle Size
MW-9-6	4 split spoon liners	Soil	Permeability, Particle size, Atterberg L.
MW-9-7	double-lined plastic bag	Soil	Particle Size, Atterberg L.
MW-9-8	" " " "	Soil	Particle Size
MW-9-9	" " " "	Soil	Particle Size

Field Information **

Special Handling and/or Storage Do not allow MW-9-6 to freeze

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate Whether Sample is Soil, Sludge, Water, Etc.
** Use Back of Page for Additional Information Relative to Sample Location.

9 2 1 2 3 1

RADIATION RELEASE

Bldg. Well #9-4 Date 1-5-87

Released By [signature]
Operational Health Physics

Remarks

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. WELL #9-5 Date 01-06-90

Released By [signature]
Operational Health Physics

Remarks <D F α Y on out side of bag.

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-6 Date 1-8-90

Released By M Copeland
Operational Health Physics

Remarks 1 silt sample MW-9-6

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-7 Date 1-18-90

Released By M Copeland
Operational Health Physics

Remarks 1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-8 Date 1-18-90

Released By M Copeland
Operational Health Physics

Remarks 1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-9 Date 1-18-90

Released By M Copeland
Operational Health Physics

Remarks 1 Sample

54-3000-022 (09/88)

9212 02 2

TEST REQUEST FORM

Sample/Specimen No. 0-045 Cost Code/Work Order No. ED 332

Requested By: Org. 80232 Person J. LINDBERG Date 1-31-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
N/A	N/A	N/A
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-9-5

Received By: R.G ALEXANDER Date 1-23-90

Approved By: R.G ALEXANDER Date 1-31-90

9212-0023

SIEVE ANALYSIS DATA SHEET

Sample ID 0-045 Page 1 of 1

Tested By R.G ALEXANDER Date 1-31-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

BEFORE TEST WT. (B) N/A AFTER TEST WT. (A) N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2 1/2	4604.83	420.98	9.1	9.1	90.9	90.9
	2		420.98	9.1	9.1	90.9	90.9
	1 1/2		734.26	15.9	15.9	84.1	84.1
	1		1172.32	25.5	25.5	74.5	74.5
	3/4		1460.73	31.7	31.7	68.3	68.3
	1/2		1935.92	42.0	42.0	58.0	58.0
	3/8		2269.19	49.3	49.3	50.7	50.7
	#4		3029.38	65.8	65.8	34.2	34.2
	#10	4604.83	3465.27	75.0	75.0	25.0	25.0
	#40	156.11	21.87	14.0	14.0	86.0	21.5
	#60		60.36	38.8	38.8	61.2	15.3
	#100		108.30	69.4	69.4	30.6	7.7
	#200		130.14	83.4	83.4	16.6	4.2

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 16.6 %

D=Original Dry Weight of Sample 156.11 g

E=Dry Weight of Sample After Washing/Sieve 130.14 g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

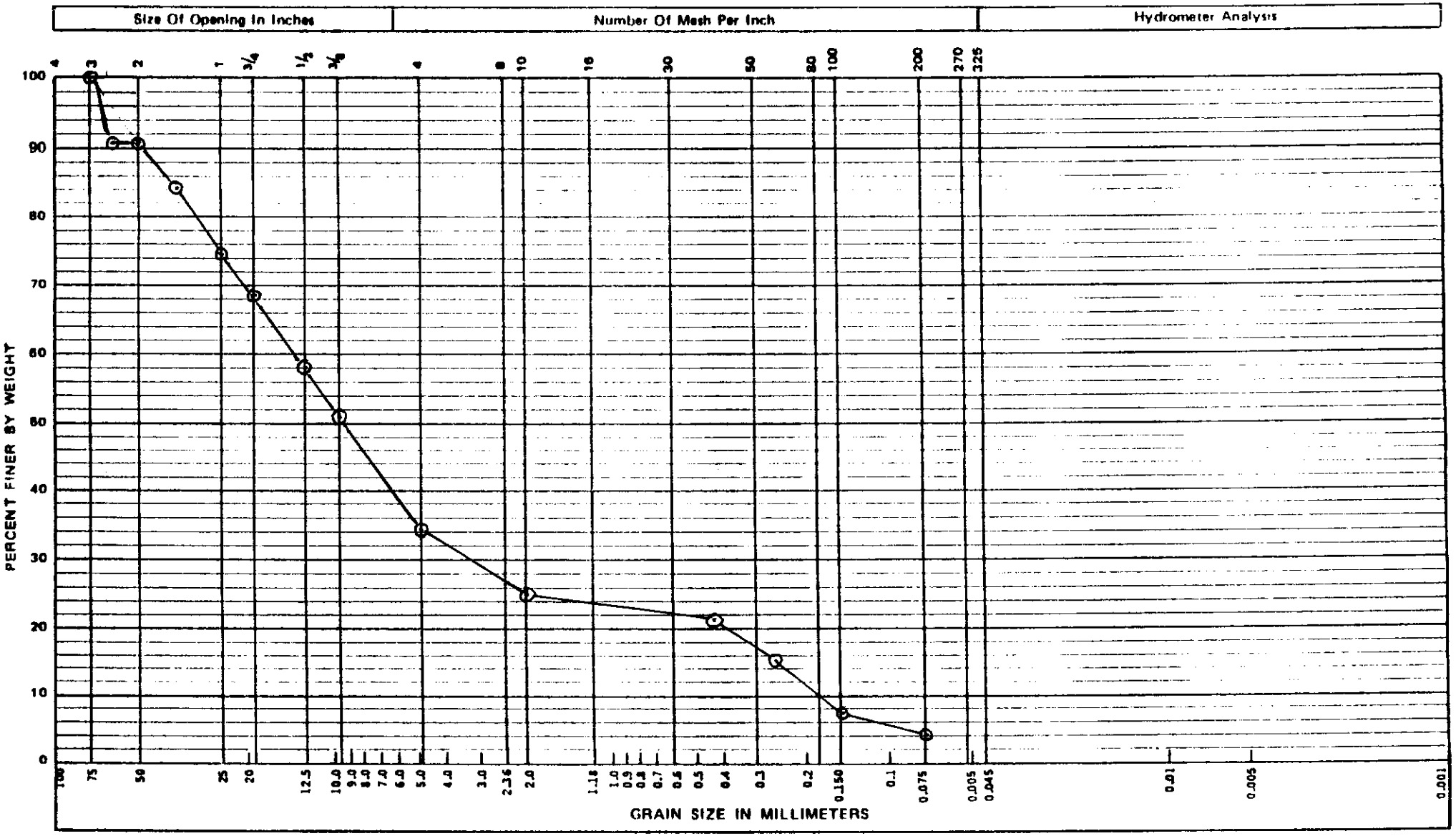
Checked By H L Berry Date 2-2-90

A-8400-204(2-87)

9211024

9 2 1 2 1 1 0 1 2 5

GRAIN SIZE ANALYSIS PLOT



Specimen No O-045 Procedure No ETAL-07 Rev 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL MW-9-5

Plotted by: R.G. ALEXANDER Date: 2-1-90

Checked by: HLBenny Date: 2-2-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-045	5510.93	5194.22	589.39	4921.54	4604.83	6.88

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 1-31-90

9212110126

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: JW Lindberg Telephone 6-5005

Sample Collected by: Steve Anderson Date: Jan 5-6, 1990 Time: NA

Sample Locations: Temp. Well No. MW-9

Ice Chest No.: NA Field Logbook & Page No.: NA

Remarks: CERCLA, 1100-EM-1 Operable Unit, Groundwater Monitoring Well, south-west side of Horn Rapids Landfill

Bill of Lading No.: NA Off Site Property No.: NA

Method of Shipment: Hand Carry

Shipped to: Jerry Alexander

Sample Identification	
~~MW-4~~ JWL 1-9-90	
→ JWL 1-9-90	
MW-9-4 below V	
MW-9-5 " "	
MW-9-6 " "	

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
Steve Anderson STEVE L ANDERSON	JW Lindberg	Jan 9, 1990; 1115
JW Lindberg JW Lindberg	RG Alexander R.G. ALEXANDER	1-28-90/0605

FVR\071889-B

9212137

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: Steve Anderson (Golder Assoc.) Date Sampled: Jan 5-19, 1990 Time: NA hours

Company Contact JW Lindberg Telephone (206) 376-8005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-9-4	double-lined plastic bags	Soil	Particle Size
MW-9-5	" " " "	Soil	Particle Size
MW-9-6	4 split spoon liners	Soil	Permeability, Particle size, Atterberg
MW-9-7	double-lined plastic bag	Soil	Particle Size, Atterberg
MW-9-8	" " " "	Soil	Particle Size
MW-9-9	" " " "	Soil	Particle Size

Field Information **

Special Handling and/or Storage Do not allow MW-9-6 to freeze

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate Whether Sample is Soil, Sludge, Water, Etc.
** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. Well #9-4 Date 1-5-87

Released By [signature]

Operational Health Physics

Remarks

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. WELL #9-5 Date 01-06-90

Released By [signature]

Operational Health Physics

Remarks <D β α γ on out-side of bag.

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-6 Date 1-8-90

Released By M Copeland

Operational Health Physics

Remarks

1 silt sample

MW-9-6

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-7 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-8 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-9 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

9 2 1 2 9 6

TEST REQUEST FORM

Sample/Specimen No. 0-046 Cost Code/Work Order No. ED332

Requested By: Org. 80232 Person J. LINDBERG Date 1-31-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
ATTERBERG LIMITS	1	ETAL-18
HYDRAULIC CONDUCTIVITY	1	ETAL-09

Remarks FIELD SAMPLE MW-9-6

Received By: R G ALEXANDER Date 1-23-90

Approved By: R.G. ALEXANDER Date 1-31-90

9212070

SIEVE ANALYSIS DATA SHEET

Sample ID O-046 Page 1 of 1

Tested By R.G. ALEXANDER Date 1-31-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description ~~SANDY GRAVEL~~ SAND/SILT RGA 3-26-90 Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A							
	#10	140.42	0	2-2-90 RGA 0	0	100	100
	#40		4.17	3.0	3.0	97.0	97.0
	#60		12.43	8.9	8.9	91.9	91.9
	#100		27.24	19.4	19.4	80.6	80.6
	#200		45.60	32.5	32.5	67.5	67.5

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 67.5 %

D=Original Dry Weight of Sample 140.42 g

E=Dry Weight of Sample After Washing/Sieve 45.60 g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

Checked By HC Benny Date 2-13-90

A-6400-204(2-87)

9211-31

SIEVE ANALYSIS DATA SHEET

Sample ID O-046 Page 1 of 1

Tested By R.G ALEXANDER Date 3-20-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0007	8-16-90
N/A	N/A	N/A

Sample Description SAND/SILT Sieve Time 10 (min)

reduced by ☒ splitting ☐ quartering ☐ stockpile

(B) (A)
BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B}$ x 100 = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A							
	#10	709.4	Ø	Ø	Ø	100	100
	#40		0.42	0.6	0.6	99.4	99.4
	#60		0.64	0.9	0.9	99.1	99.1
	#100		1.18	1.7	1.7	98.3	98.3
	#200		2.84	4.0	4.0	96.0	96.0

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 96.0 %

D=Original Dry Weight of Sample 709.4 g

E=Dry Weight of Sample After Washing/Sieve 2.84 g

C = <(D-E)/D> X 100

Remarks
WASH WITH DISPERSING AGENT.

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

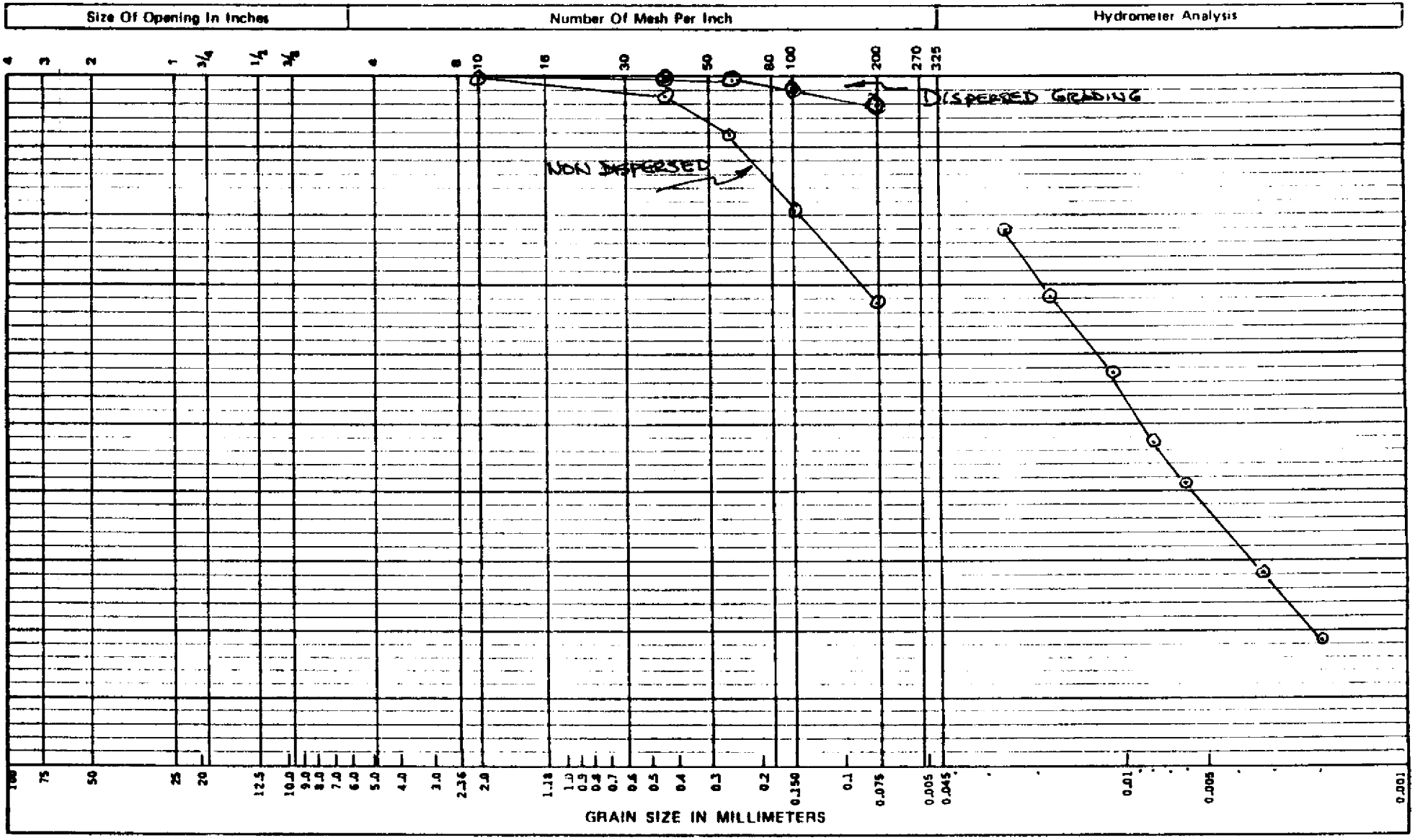
Checked By John T Reilly Date 3-21-90

A-6400-204(2-87)

9211103.32

9212110033

GRAIN SIZE ANALYSIS PLOT



Specimen No O-046 Procedure No ETAL-07 Rev 1 Date Issued 11-1589

Sample Description: ~~SANDY GRAVEL~~ ROK 3-20-90
MW-9-6 SAND/SILT

Plotted by: R.G ALEXANDER
Date: 1-31-90

Checked by: HC Benny
Date: 2-13-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-046	2597.45	2216.75	829.58	1767.87	1387.17	27.44

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 1-31-90

HYDROMETER ANALYSIS DATA SHEET

Sample ID 0-046 Page ____ of ____

Tested By R.G ALEXANDER Date 3-19-90

Procedure ET4C-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	NO.	CALIBRATION DUE DATE
Hydrometer	1000	2-16-91
Balance	3304	3-25-90
Thermometer/Thermocouple	0002	2-9-91

Specific gravity of Sample 2.62

% Passing No. 10 Sieve 100 (%)

Hygroscopic Correction Factor N/A

WEIGHT OF SAMPLE

Wt. Container + Soil N/A (g)

Wt. Container N/A (g)

Wt. Soil 70.94 (g)

COMPOSITE CORRECTION

1st Reading 5 at 24.0 °C

2nd Reading 5 at 23.4 °C

HYGROSCOPIC MOISTURE CONTENT

Wt. Container + Air Dry Soil N/A (g)

Wt. Container + Oven Dry Soil N/A (g)

Wt. Container N/A (g)

Water Content N/A (%)

REMARKS

TUBE C

W= 70.94

PAN G 117.87

Date	Clock time	Elapsed time (min)	Hydrometer reading	Hydrometer with composite correction	Temp. (°C)	Soil in suspension (%)	Particle diameter (mm)
3-19	0842	2.0	60	55	24.0	78.3	0.024
	0845	5.0	53	48	24.0	68.3	0.016
	0855	15.0	45	40	23.9	56.9	0.010
	0910	30.0	38	33	23.9	47.0	0.008
	0940	60.0	34	29	23.9	41.3	0.006
	1250	250.00	25	20	24.1	28.5	0.003
3-20	0840	1,440.0	18	13	23.3	18.5	0.001

Formulas and Tables used to calculate percent Soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By J J Rebyea Date 3-21-90

SPECIFIC GRAVITY OF SOILS DATA SHEET

Specimen/Sample No. O-046 Page 1 of 1

Test Operator R.G. ALEXANDER 3-5-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0007	8-16-90
Thermometer	0002	2-9-91
Pycnometer	2554	N/A

Wetting Agent "Q" WATER

	DETERMINATION NO.	1	2	3
	Drying Container No.	N/A	N/A	N/A
	Wt. Container + Oven Dry Soil, ± 0.01g	N/A		
	Wt. Container, ± 0.01g	N/A		
W_o	Wt. Oven Dry Soil, g	40.00		
	Pycnometer No.	2554		
	Wt. Pycnometer, g	135.72		
W_a	Wt. Pycnometer + Wetting Agent, g	387.10		
W_b	Wt. Pycnometer + Wetting Agent + Soil, g	411.90		
	Temperature, T_x at W_b, °C	24.5C		
G_w	Specific Gravity of Wetting Agent at T_x	1.00		
G_t	Specific Gravity of Soil at T_x	2.63		
G_s	Specific Gravity of Soil at 20°C	2.62		

$$G_t = \frac{G_{w*}\gamma_{w*}W_o}{W_o + (W_a - W_b)}$$

γ_w = Unit Weight Of Water (g/cc)

*$G_s = K \cdot G_t$

K values found in ASTM D854-58, Table 1

*NOTE $G_s = G_t$ When Test Run at 20 °c

Average Specific Gravity At 20°c	2.62

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HC Benny Date 3-7-90

A-6400-235 (9-86)

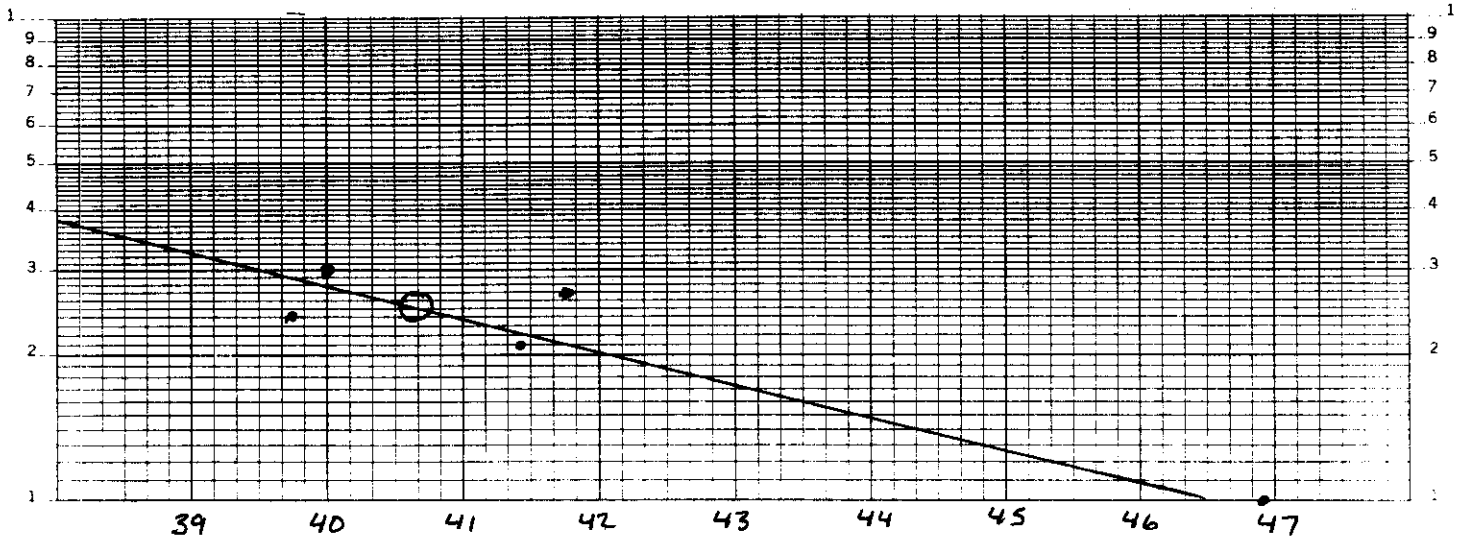
9212136

PLASTIC INDEX SOILS DATA SHEET

Sample No. O-046 Page 1 of 2

Test Operator HLBenny Date 4/16/90

Thermometer No. 0007 Calibration Date 8-16-90



Liquid Limit (LL) 40.66 Graph

Liquid Limit (LL) NA One Point

Moisture (LL) 40.66%

Plastic Limit (PL) 28.92 (Avg.)

Moisture (PL) 27.97% 30.87% 27.91%

Plastic Index (PI)* 11.74

*PI = LL – PL

Remarks

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. LDB 4/16/90
THE TEST OPERATOR WAS APPROPIATELY TRAINED AND ULITIZED CALIBRATED TEST INSTRUMENTS. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THIS DATA.

9211337

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-018 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8-16-90

Blows	SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
	0-046-1	21.53	21.13	19.70	1.83	1.43	27.97
	-2	22.49	21.82	19.65	2.84	2.17	30.87
	-3	15.51	14.60	11.34	4.17	3.26	27.91
					Average % Water		28.92
21	0-046-4	34.57	30.25	19.82	14.75	10.43	41.42
24	-5	32.91	29.18	19.79	13.12	9.39	39.72
27	-6	34.88	30.44	19.81	15.07	10.63	41.77
30	-7	24.05	20.45	11.45	12.60	9.00	40.00
10	-8	28.72	23.15	11.27	17.45	11.88	46.89

JAB 4/16/90 ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: H C Benny DATE 4/16/90

9211139

HYDRAULIC CONDUCTIVITY OF SOILS DATA SHEET

Sample No. O-046 Page 1 of 5

Test Operator R. G. ALEXANDER Date 1-31-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0006	2-6-90
Thermometer	N/A	N/A
Thermocouple		
Temperature Controller		
Pressure Gauge		
Pressure Transducer		
Pressure Transducer		
Back Pressure Gauge		
Pressure Transducer		
Pressure Transducer		
Calipers	5623	8-16-90
Load Frame	N/A	N/A
Data Logger		
N/A		
N/A		
N/A		

☐ Immediate (User) Calibration Performed. (Documentation To Be Attached)

Sample Preparation

PARTICLE SIZE (Sieve Mesh Range)

N/A	To	N/A
	To	
	To	
	To	
	To	
	To	
	To	

WEIGHT

N/A	%
	%
	%
	%
	%
	%
	%
Total	100 %

OTHER COMPONENTS

N/A	

N/A	%
	%
	%
Total	100 %

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HC Benny Date 2-13-90

9211139

Specimen No. 0-046

SAMPLE PREPARATION

Determine Weight of Samples in Container

Container No.	10
Wt. of Sample + Container, g	2597.45
Wt. of Container, g	829.58
Wt. of Sample, g	1767.87

Determine the Water Content of the "Air Dry" Sample

Container No.	10
Wt. Container & Wet Soil (A), g	2597.45
Wt. Container & Dry Soil (B), g	2216.75
Wt. of Water, g	380.70
Wt. of Container (C), g	829.58
Wt. of Dry Soil, W_s, g	1387.17
Water Content (W), %	27.44

$$W = \left(\frac{A - B}{B - C}\right) 100$$

SAMPLE COMPONENT	SPECIFIC GRAVITY, G	LABORATORY NOTEBOOK DATA LOCATION
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HCBenny Date 2-13-90

Sample No. O-046

SAMPLE COMPACTION

Compaction Method Static ~~N/A~~ Tamping ~~N/A~~

STATIC	Load Applied, g/ Layer length, cm	Layer 1	N/A	11	N/A
or		2		12	
TAMPING	No. Tamps per Layer/ Layer Length, cm	3		13	
		4		14	
		5		15	
		6		16	
		7		17	
Total No. of Layers N/A		8		18	
INTACT SAMPLE IN 4"x6" STEEL TUBE		9		19	
		10		20	

Tamper Foot Diameter cm	N/A
Tamper Applied Load, g	N/A
Sample Diameter, (d), cm	9.82
Sample Length, (L), cm	15.25
Sample Mold or Permeameter Weight & Compacted Sample, g	2822.04
Sample Mold or Permeameter Weight, g	593.25
Weight of Compacted Sample, (E), g	2228.79
Weight of Container & Uncompacted Wet Sample, (A), g	2597.45
Weight of Container & Uncompacted Dry Sample, (B), g	2216.75
Weight of Water, g	380.70
Weight of Container, (C), g	829.58
Weight of Dry Soil, (WS), g	1387.17
Water Content, %	27.44
Compacted Bulk Density of Sample, (γm), g/cc	1.93
Compacted Sample Dry Density, (γd), g/cc	1.51

$$\gamma m = \frac{E}{(\pi)(d/2)^2(L)}$$

$$\gamma d = \left(\frac{\gamma m}{W + 100}\right) 100$$

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H L Benny Date 2-13-90

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID. 0-046 Page 4 of 5

Procedure No. ETAL-09 Date Issued 12-1-89

DATE	TIME			VOLUME DETERMINANTS							Operator Initials
				Effluent		Container		System	Pressure		
Year 90 (Mo/Day)	System Down (Hr: Min)	System Up (Hr: Min)	Time Change (Hr: Min)	Temp (°C)	Weight (±0.1g)	Tare (±0.1g)	Tare & Effluent (±0.1g)	Temp (°C)	Pore H_2O ~~4psi~~ CM	Back H_2O (psi)	
2-7	—	16:35	—	—	—	67.73	—	—	191.0	N/A	RGA
2-9	1105	1110	42:30	22	3.88	67.73	71.61	22	191.0	N/A	RGA
2-10	1110	1115	24:00	22	2.27	67.73	70.00	22	191.0	N/A	RGA
2-12	0715	0720	44:00	21	4.31	67.73	72.04	21	191.0	N/A	RGA
2-12	1620	1625	9:00	22	1.29	67.73	69.02	22	191.0	N/A	RGA
2-13	0725	STOP	15:00	22	1.27	67.73	69.00	22	191.0	N/A	RGA
2-13	STOP TEST			—	—	—	—	—	—	—	RGA

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HC Benny Date 2-13-90

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID 0-046 Page 5 of 5

Procedure No. ETAL-09 Date Issued 12-1-89

Date Year 90 (Mo/Day)	Hydraulic Conductivity (cm/sec)	Hydraulic Gradient (cm/cm)	Effluent Analysis (Sample Number)	Effluent Analysis Lab. Notebook Location	Effluent Description	Operator Initials
2-7	START	TEST	—	—	—	RGA
2-9	2.67×10^{-8}	12.53	—	—	CLEAR	RGA
2-10	2.77×10^{-8}	12.53	—	—	CLEAR	RGA
2-12	2.87×10^{-8}	12.53	—	—	CLEAR	RGA
2-12	4.20×10^{-8}	12.53	—	—	CLEAR	RGA
2-13	2.48×10^{-8}	12.53	—	—	CLEAR	RGA
2-13	STOP TEST	2.6 +/- 0.2 $\times 10^{-8}$ CM/SEC			—	RGA

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H L Benny Date 2-13-90

9212170113

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: JWLindberg Telephone 6-5005

Sample Collected by: Steve Anderson Date: Jan 5-6, 1990 Time: NA

Sample Locations: Temp. Well No. MW-9

Ice Chest No.: NA Field Logbook & Page No.: NA

Remarks: CERCLA, 1100-EM-1 Operable Unit, Groundwater Monitoring Well, south-west side of Horn Rapids Landfill

Bill of Lading No.: NA Off Site Property No.: NA

Method of Shipment: Hand Carry

Shipped to: Jerry Alexander

Sample Identification

~~MW-4~~ JWL 1-9-90

→ JWL 1-9-90

MW-9-4 below ∇

MW-9-5 " "

MW-9-6 " "

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
STEVE L ANDERSON [signature]	[signature]	Jan 9, 1990; 11:15
[signature] JWLindberg	RG [signature] R.G. ALEXANDER	1-28-90/0605

FVR\071889-B

9 2 1 2 . . . . 4 4

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: Steve Anderson Golder Assoc. Date Sampled: Jan 5-19, 1990 Time: N/A hours

Company Contact JW Lindberg Telephone (206) 376-8005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-9-4	double-lined plastic bags	Soil	Particle Size
MW-9-5	" " " "	Soil	Particle Size
MW-9-6	4 split spoon liners	Soil	Permeability, Particle size, Atterberg L.
MW-9-7	double-lined plastic bag	Soil	Particle Size, Atterberg L.
MW-9-8	" " " "	Soil	Particle Size
MW-9-9	" " " "	Soil	Particle Size

Field Information **

Special Handling and/or Storage Do not allow MW-9-6 to freeze

PART II: LABORATORY SECTION

Received by ______ Title ______ Date ______

Analysis Required ______

* Indicate Whether Sample is Soil, Sludge, Water, Etc.
** Use Back of Page for Additional Information Relative to Sample Location.

9 2 1 2 7 1 0 . 4 5

RADIATION RELEASE

Bldg. Well #9-4 Date 1-5-87

Released By [signature]

Operational Health Physics

Remarks

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. WELL #9-5 Date 01-06-90

Released By [signature]

Operational Health Physics

Remarks <D β, α & on out side of bag.

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-6 Date 1-8-90

Released By M Copeland

Operational Health Physics

Remarks

1 silt sample MW-9-6

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-7 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-8 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-9 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

9 2 1 ... 4 5

TEST REQUEST FORM

Sample/Specimen No. 07047 Cost Code/Work Order No. ED332

Requested By: Org. 80232 Person J. LINDBERG Date 2-1-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
ATTERBERG LIMITS	1	ETAL-18
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-9-7

Received By: R.G. ALEXANDER Date 1-23-90

Approved By: R.G. ALEXANDER Date 2-1-90

SIEVE ANALYSIS DATA SHEET

Sample ID 0-047 Page 1 of 1

Tested By R.G. Alexander Date 2-1-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description ~~SANDY GRAVEL~~ RGA 1-31-90 Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) BEFORE TEST WT. N/A (A) AFTER TEST WT. N/A $\frac{B-A}{B}$ X 100 = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A							
	3/4	3899.52	Ø	Ø	Ø	100	100
	1/2		13.77	0.4	0.4	99.6	99.6
	3/8		13.77	0.4	0.4	99.6	99.6
	#4		13.77	0.4	0.4	99.6	99.6
	#10	3899.52	13.77	0.4	0.4	99.6	99.6
	#40	153.29	1.82	1.2	1.2	98.8	98.4
	#60		5.48	3.6	3.6	96.4	96.0
	#100		25.80	16.8	16.8	83.2	82.9
	#200		84.54	55.2	55.2	44.8	44.6

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 44.8 %

D=Original Dry Weight of Sample 153.29 g

E=Dry Weight of Sample After Washing/Sieve 84.54 g

C = <(D-E)/D> X 100

Remarks
WASH FINE GRADING
SMALL FIELD
SAMPE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

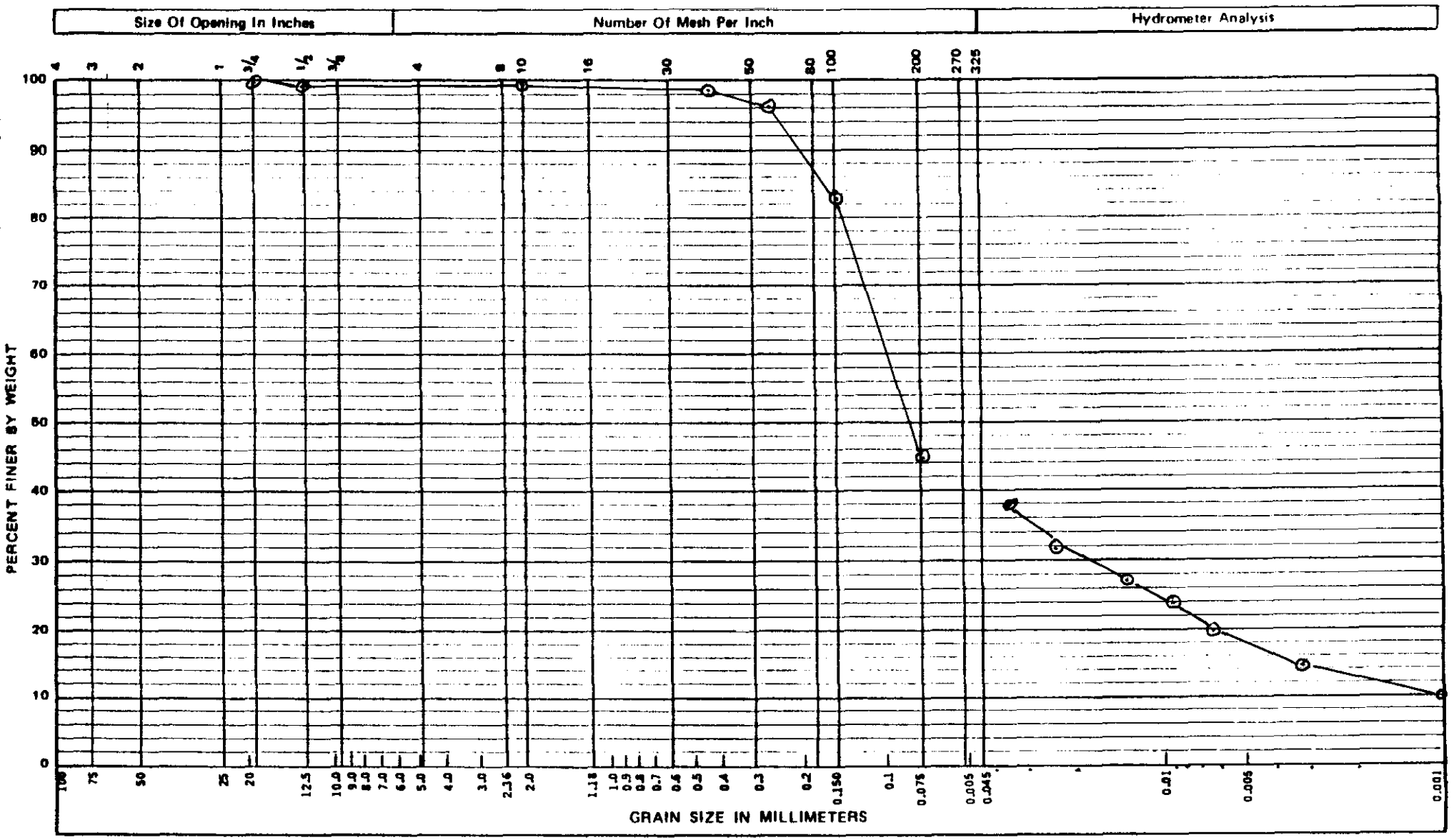
Checked By H L Berry Date 2/2/90

A-6400-204(2-87)

9 2 1 2 1 0 4 3

9 2 1 2 [illegible] 1 9

GRAIN SIZE ANALYSIS PLOT



Specimen No 0-047 Procedure No ETAL-07 Rev 1 Date Issued 11-15-89

Sample Description: MW-9-7 ~~SANDY GRAVEL~~ RGA 1-31-90

Plotted by: R.G ALEXANDER Date: 2-1-90

Checked by: H.L Benny Date: 2-2-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-047	5530.47	4477.58	578.06	4952.41	3899.52	27.00

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G ALEXANDER DATE 2-1-90

9213150

HYDROMETER ANALYSIS DATA SHEET

Sample ID 0-047 Page 1 of 1

Tested By R.G. ALEXANDER Date 3-20-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	NO.	CALIBRATION DUE DATE
Hydrometer	1000	2-16-91
Balance	3304	3-25-90
Thermometer/Thermocouple	0002	2-9-91

Specific gravity of Sample 2.55

% Passing No. 10 Sieve 99.6 (%)

Hygroscopic Correction Factor N/A

WEIGHT OF SAMPLE

Wt. Container + Soil N/A (g)

Wt. Container N/A (g)

Wt. Soil 71.31 (g)

COMPOSITE CORRECTION

1st Reading 5 at 23.6 °C

2nd Reading N/A at N/A °C

HYGROSCOPIC MOISTURE CONTENT

Wt. Container + Air Dry Soil N/A (g)

Wt. Container + Oven Dry Soil N/A (g)

Wt. Container N/A (g)

Water Content N/A (%)

REMARKS

TUBE B

Wt 71.60

Date	Clock time	Elapsed time (min)	Hydrometer reading	Hydrometer with composite correction	Temp. (°C)	Soil in suspension (%)	Particle diameter (mm)
3-20	0942	2.0	32	27	23.7	38.5	0.032
3-20	0945	5.0	27	22	23.8	31.3	0.021
3-20	0955	15.0	24	19	23.9	27.1	0.012
3-20	1010	30.0	22	17	24.0	24.2	0.009
3-20	1040	60.0	19	14	23.8	19.9	0.006
3-20	1350	250.00	15	10	24.5	14.2	0.003
3-21	0940	1,440.0	12	7	23.2	10.0	0.001

Formulas and Tables used to calculate percent Soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By John Relyea Date 3-23-90

SPECIFIC GRAVITY OF SOILS DATA SHEET

Specimen/Sample No. 0-047 Page 1 of 1

Test Operator R.G ALEXANDER 3-6-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0007	8-16-90
Thermometer	0002	2-9-91
Pycnometer	2554	N/A

Wetting Agent "Q" WATER

	DETERMINATION NO.	1	2	3
	Drying Container No.	N/A	N/A	N/A
	Wt. Container + Oven Dry Soil, ± 0.01g	N/A		
	Wt. Container, ± 0.01g	N/A		
W_o	Wt. Oven Dry Soil, g	40.00		
	Pycnometer No.	2554		
	Wt. Pycnometer, g	135.12		
W_a	Wt. Pycnometer + Wetting Agent, g	387.09		
W_b	Wt. Pycnometer + Wetting Agent + Soil, g	411.47		
	Temperature, T_x at W_b, °C	25.4 C		
G_w	Specific Gravity of Wetting Agent at T_x	1.00		
G_t	Specific Gravity of Soil at T_x	2.56		
G_s	Specific Gravity of Soil at 20°C	2.55		

$$G_t = \frac{G_{w*}\gamma_{w*}W_o}{W_o + (W_a - W_b)}$$

γ_w = Unit Weight Of Water (g/cc)

*$G_s = K \cdot G_t$

K values found in ASTM D854-58, Table 1

*NOTE $G_s = G_t$ When Test Run at 20 °c

Average Specific Gravity At 20°c	2.55

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H L Benny Date 3-7-90

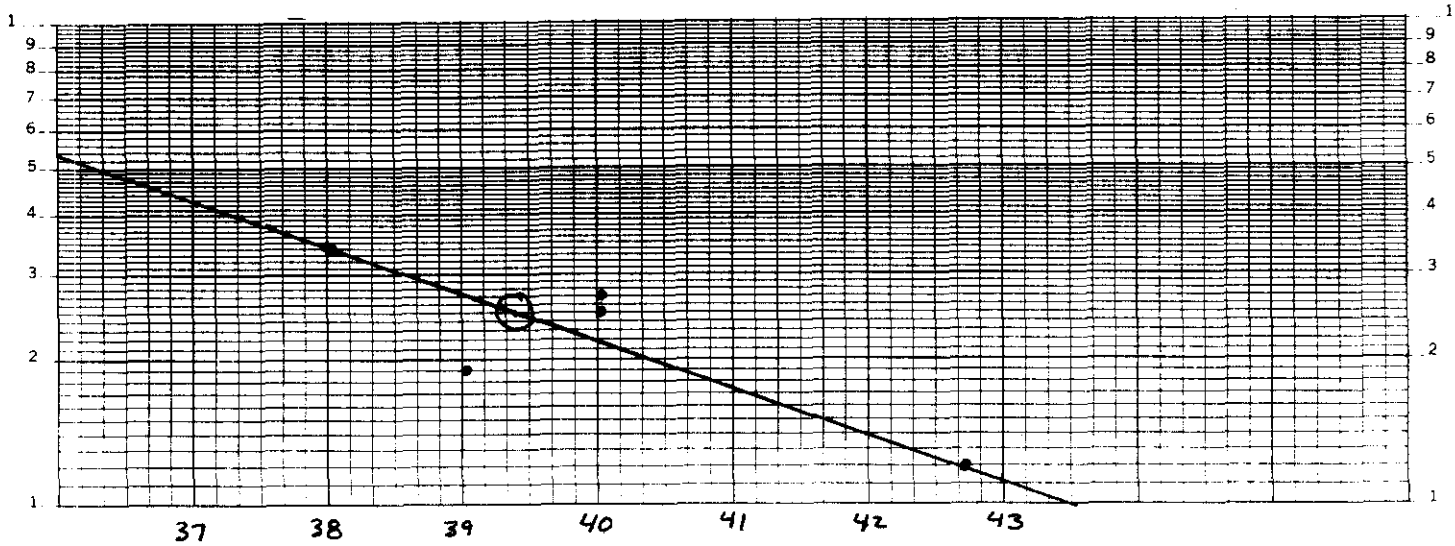
A-6400-235 (9-86)

PLASTIC INDEX SOILS DATA SHEET

Sample No. O-047 Page 1 of 2

Test Operator HLBenny Date 4/16/90

Thermometer No. 0007 Calibration Date 8-16-90



Liquid Limit (LL) 39.42 Graph Plastic Limit (PL) NA (Avg.)

Liquid Limit (LL) NA One Point Moisture (PL) NA % NA %

Moisture (LL) 39.42 % Plastic Index (PI)* NA

*PI = LL − PL

Remarks Non-Plastic

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPIATELY TRAINED AND ULITIZED CALIBRATED TEST INSTRUMENTS. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THIS DATA. Lab 4/16/90

9 2 1 2 1 1 3

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-18 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8/16/90

Blows	SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
34	0-047-1	38.68	33.35	19.34	19.34	14.01	38.04
12	-2	35.65	30.88	19.71	15.94	11.17	42.70
19	-3	34.31	30.07	19.22	15.09	10.85	39.08
25	-4	36.72	31.62	18.89	17.83	12.73	40.06
27	-5	36.85	31.98	19.82	17.03	12.16	4005

4/16/90

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: HC Benny DATE 4/16/90

9211354

Westinghouse Hanford Company

CHAIN OF CUSTODY

Company Contact: J.W. LINDBERG Telephone: 6-5005

Sample Collected by: STEVE L ANDERSON (GAT) Date: 011790-011890 Time: N/A

Sample Locations: MW-9, HORN RAPIDS LANDFILL

Ice Chest No.: N/A Field Logbook Page No.: WHC-N-306, p. 34-35

Remarks: CERCLA, 1100-EM-1 OPERABLE UNITS, GROUNDWATER MONITORING WELLS

Method of Shipment: HAND CARRY

Sample Identification

MW-9-7	DOUBLE-LINED PLASTIC BAG
MW-9-8	" " "
MW-9-9	" " "

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
[signature] / STEVE L ANDERSON	[signature] JW Lindberg	1-22-90 3:48PM
[signature] JW Lindberg	RG [signature] RG ALEXANDER	1-23-90 / 0605

5 5 0 1 1 2 1 2 9

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: Steve Anderson (Golder Assoc.) Date Sampled: Jan 5-19, 1990 Time: NA hours

Company Contact JW Lindberg Telephone (206) 376-2005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-9-4	double-lined plastic bags	Soil	Particle Size
MW-9-5	" " " "	Soil	Particle Size
MW-9-6	4 split spoon liners	Soil	Permeability, Particle size, Atterberg L.
MW-9-7	double-lined plastic bag	Soil	Particle Size, Atterberg L.
MW-9-8	" " " "	Soil	Particle Size
MW-9-9	" " " "	Soil	Particle Size

Field Information **

Special Handling and/or Storage Do not allow MW-9-6 to freeze

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. Well #9-4 Date 1-5-87

Released By _____
Operational Health Physics

Remarks _____

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. WELL #9-5 Date 2-06-90

Released By _____
Operational Health Physics

Remarks <200 c/m on dirt side of bag.

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-6 Date 1-8-90

Released By _____
Operational Health Physics

Remarks 1 Soil Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-7 Date 1-18-90

Released By _____
Operational Health Physics

Remarks 1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-8 Date 1-18-90

Released By _____
Operational Health Physics

Remarks 1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-9 Date 1-18-90

Released By _____
Operational Health Physics

Remarks 1 Sample

54-3000-022 (09/88)

TEST REQUEST FORM

Sample/Specimen No. 0-048 Cost Code/Work Order No. ED 332

Requested By: Org. 80232 Person J. LINDBERG Date 2-1-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
N/A	N/A	N/A
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-9-8

Received By: R G ALEXANDER Date 1-23-90

Approved By: R.G ALEXANDER Date 2-1-90

9212130

SIEVE ANALYSIS DATA SHEET

Sample ID O-048 Page 1 of 1

Tested By R.G. ALEXANDER Date 2-1-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SAND Sieve Time 10 (min)

reduced by ☒ splitting ☐ quartering ☐ stockpile

BEFORE TEST WT. (B) N/A AFTER TEST WT. (A) N/A $\frac{B-A}{B}$ X 100 = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A							
	#10	153.29	∅	∅	∅	100	100
	#40		2.16	1.4	1.4	98.6	98.6
	#60		25.98	16.9	16.9	83.1	83.1
	#100		75.16	49.0	49.0	51.0	51.0
	#200		121.77	79.4	79.4	20.6	20.6

Finess Modules (FM) ____________ (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 20.6 %

D=Original Dry Weight of Sample 153.29 g

E=Dry Weight of Sample After Washing/Sieve 121.77 g

C = <(D-E)/D> X 100

Remarks
WASH FINE GRADING
SMALL FIELD
SAMPLE

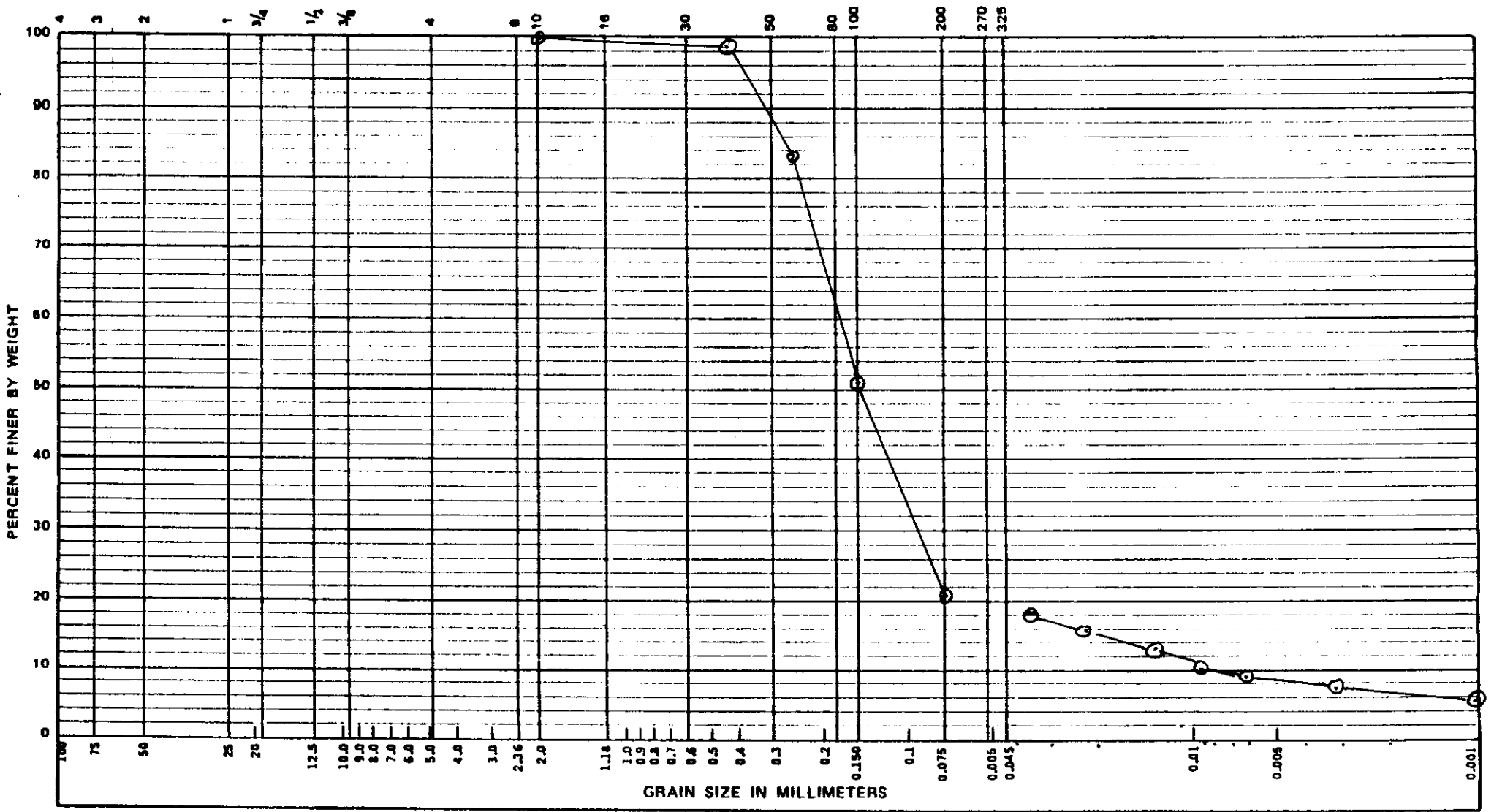
ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

Checked By HL Benny Date 2-2-90

A-6400-204(2-87)

9212110150

GRAIN SIZE ANALYSIS PLOT



Specimen No 0-048 Procedure No ETAL-07 Rev 1 Date Issued 11-15-89

Sample Description: SANDY ~~GRAVEL~~ Rev 1-31-90
MW-9-8

Plotted by: R.G. ALEXANDER
Date: 2-1-90

Checked by: HC Benny
Date: 2-2-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAK-14 REV. NO. Ø

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0048	5541.66	4457.79	835.76	4705.90	3622.03	29.92

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G ALEXANDER DATE 2-1-90

HYDROMETER ANALYSIS DATA SHEET

Sample ID O-048 Page 1 of 1

Tested By R.G. ALEXANDER Date 3-20-90

Procedure ETAC-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	NO.	CALIBRATION DUE DATE
Hydrometer	1000	2-16-90
Balance	3304	3-25-90
Thermometer/Thermocouple	0002	2-9-91

Specific gravity of Sample 2.61

% Passing No. 10 Sieve 100 (%)

Hygroscopic Correction Factor N/A

WEIGHT OF SAMPLE

Wt. Container + Soil N/A (g)

Wt. Container N/A (g)

Wt. Soil 70.33 (g)

COMPOSITE CORRECTION

1st Reading 5 at 23.6 °C

2nd Reading N/A at N/A °C

HYGROSCOPIC MOISTURE CONTENT

Wt. Container + Air Dry Soil N/A (g)

Wt. Container + Oven Dry Soil N/A (g)

Wt. Container N/A (g)

Water Content N/A (%)

REMARKS

TUBE C

Date	Clock time	Elapsed time (min)	Hydrometer reading	Hydrometer with composite correction	Temp. (°C)	Soil in suspension (%)	Particle diameter (mm)
3-20	0952	2.0	18	13	23.8	18.7	0.034
3-20	0955	5.0	16	11	23.9	15.8	0.022
3-20	1005	15.0	14	9	24.0	12.9	0.013
3-20	1020	30.0	12	7	23.8	10.1	0.009
3-20	1050	60.0	11	6	23.7	8.6	0.006
3-20	1400	250.00	10	5	24.5	7.2	0.003
3-21	0950	1,440.0	9	4	23.2	5.7	0.001

Formulas and Tables used to calculate percent Soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By John Robyson Date 3-23-90

SPECIFIC GRAVITY OF SOILS DATA SHEET

Specimen/Sample No. D-048 Page 1 of 1

Test Operator R.G. ALEXANDER 3-6-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0007	8-16-90
Thermometer	0002	2-9-91
Pycnometer	2554	N/A

Wetting Agent "Q" WATER

	DETERMINATION NO.	1	2	3
	Drying Container No.	N/A	N/A	N/A
	Wt. Container + Oven Dry Soil, ± 0.01g	N/A		
	Wt. Container, ± 0.01g	N/A		
W_o	Wt. Oven Dry Soil, g	40.00		
	Pycnometer No.	2554		
	Wt. Pycnometer, g	135.72		
W_a	Wt. Pycnometer + Wetting Agent, g	387.10		
W_b	Wt. Pycnometer + Wetting Agent + Soil, g	411.80		
	Temperature, T_x at W_b, °C	25.2 C		
G_w	Specific Gravity of Wetting Agent at T_x	1.00		
G_t	Specific Gravity of Soil at T_x	2.61		
G_s	Specific Gravity of Soil at 20°C	2.61		

$$G_t = \frac{G_w * \gamma_w * W_o}{W_o + (W_a - W_b)}$$

γ_w = Unit Weight Of Water (g/cc)

*$G_s = K \cdot G_t$

K values found in ASTM D854-58, Table 1

*NOTE $G_s = G_t$ When Test Run at 20 °c

Average Specific Gravity At 20°c	2.61

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H L Benny Date 3-7-90

A-6400-235 (9-86)

9212-1-163

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: J.W. LINDBERG Telephone: 6-5005

Sample Collected by: STEVE L ANDERSON (GAI) Date: 011790-011890 Time: N/A

Sample Locations: MW-9, HORN RAPIDS LANDFILL

Ice Chest No.: N/A Field Logbook Page No.: WHC-N-306, P 34-35

Remarks: CERCLA, 1100-EM-1 OPERABLE UNITS, GROUNDWATER MONITORING WELLS

Method of Shipment: HAND CARRY

Sample Identification

MW-9-7	DOUBLE-LINED PLASTIC BAG	
MW-9-8	" "	"
MW-9-9	" "	"

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
Steve Anderson / STEVE L ANDERSON	J W Lindberg J W LINDBERG	1-22-90 3:48PM
Relinquished by:	Received by:	Date/Time:
J W Lindberg J W LINDBERG	R G Alexander R.G ALEXANDER	1-23-90/0605
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9212354

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: Steve Anderson (Golder Assoc.) Date Sampled: Jan 5-19, 1990 Time: NA hours

Company Contact JW Lindberg Telephone (206) 376-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-9-4	double-lined plastic bags	Soil	Particle Size
MW-9-5	" " " "	Soil	Particle Size
MW-9-6	4 split spoon liners	Soil	Permeability, Particle size, Atterberg L.
MW-9-7	double-lined plastic bag	Soil	Particle Size, Atterberg L.
MW-9-8	" " " "	Soil	Particle Size
MW-9-9	" " " "	Soil	Particle Size

Field Information **

Special Handling and/or Storage Do not allow MW-9-6 to freeze

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. Well #9-4 Date 1-5-89

Released By [illegible signature]

Operational Health Physics

Remarks

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. WELL #9-5 Date 01-06-90

Released By [illegible signature]

Operational Health Physics

Remarks <D β-α γ on out side of bag.

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-6 Date 1-8-90

Released By M Copeland

Operational Health Physics

Remarks

1 silt sample MW-9-6

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-7 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-8 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-9 Date 1-18-90

Released By M Copeland

Operational Health Physics

Remarks

1 Sample

54-3000-022 (09/88)

9212 [illegible]

TEST REQUEST FORM

Sample/Specimen No. 0-049 Cost Code/Work Order No. ED332

Requested By: Org. 80232 Person J. LINDBERG Date 2-1-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (CF REQ)
N/A	N/A	N/A
N/A	N/A	N/A

Remarks FIELD SAMPLES MW-9-9

Received By: R G ALEXANDER Date 1-23-90

Approved By: R.G. ALEXANDER Date 2-1-90

9212130067

SIEVE ANALYSIS DATA SHEET

Sample ID O-049 Page 1 of 1

Tested By R.G. ALEXANDER Date 2-1-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0006	2-6-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2	4110.25	Ø	Ø	Ø	100	100
	1 1/2		Ø	Ø	Ø	100	100
	1		202.58	4.9	4.9	95.1	95.1
	3/4		818.44	19.9	19.9	80.1	80.1
	1/2		1907.12	46.4	46.4	53.6	53.6
	3/8		2527.88	61.5	61.5	38.5	38.5
	#4		3176.84	77.3	77.3	22.7	22.7
	#10	4110.25	3524.93	85.8	85.8	14.2	14.2
	#40	151.63	24.07	15.9	15.9	84.1	11.9
	#60		75.48	49.8	49.8	50.2	7.1
	#100		98.02	64.6	64.6	35.4	5.0
	#200		117.55	77.5	77.5	22.5	3.2

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 22.5 %

D=Original Dry Weight of Sample 151.63g

E=Dry Weight of Sample After Washing/Sieve 117.55g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

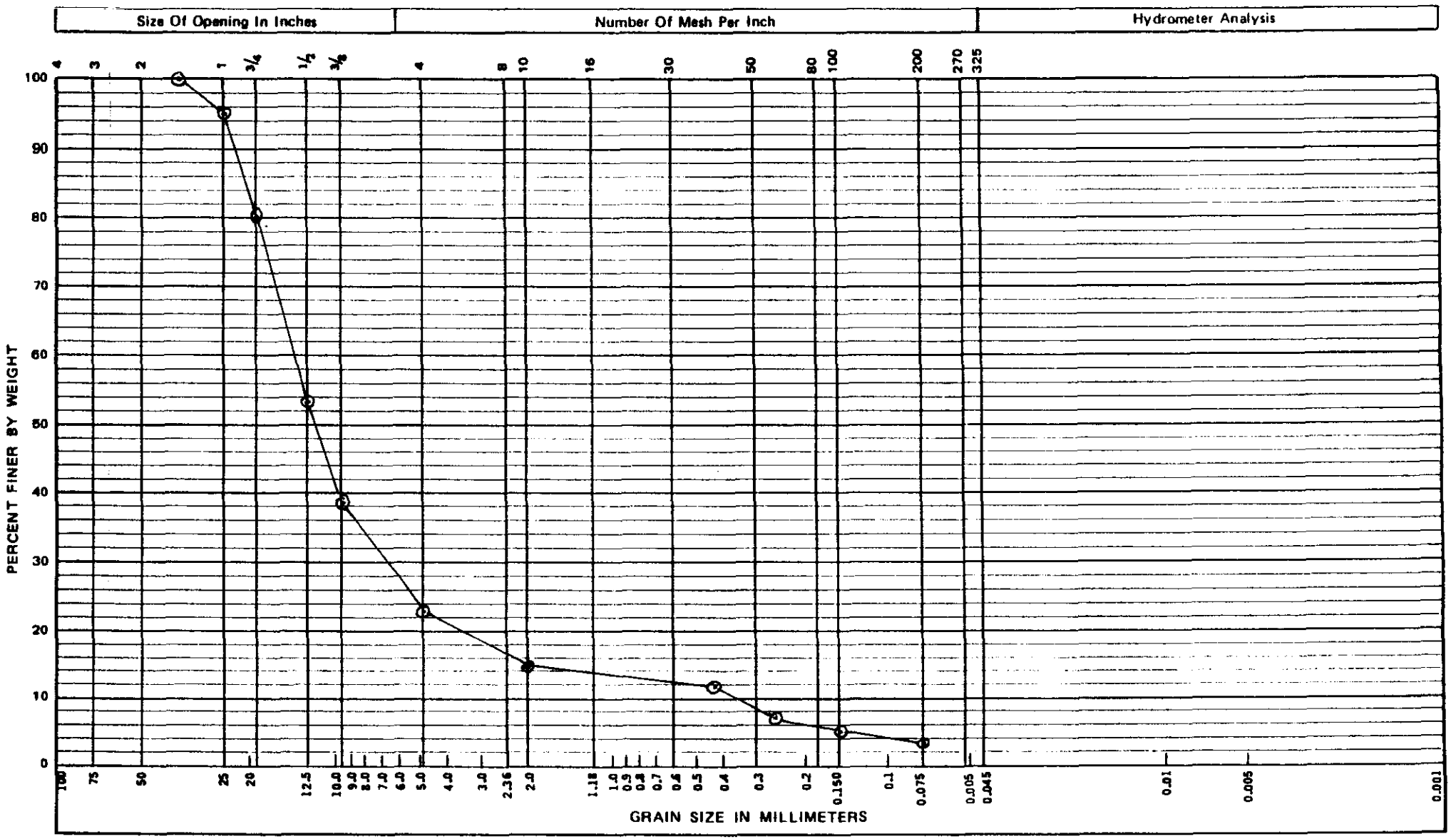
Checked By H C Benny Date 2-8-90

A-8400-204(2-87)

9211163

9212 [illegible] 0469

GRAIN SIZE ANALYSIS PLOT



Specimen No. O-049 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description:	Plotted by:	Checked by:
SANDY GRAVEL MW-9-9	R-G ALEXANDER	H C Benny
	Date: 2-1-90	Date: 2-8-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0006 CALIBRATION DUE DATE 2-6-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-049	5505.41	4966.81	856.56	4648.85	4410.25	13.10

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G ALEXANDER DATE 2-1-90

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Company Contact: J.W. LINDBERG Telephone: 6-5005

Sample Collected by: STEVE L ANDERSON (GAI) Date: 011790-011890 Time: N/A

Sample Locations: MW-9, HORN RAPIDS LANDFILL

Ice Chest No.: N/A Field Logbook Page No.: WHC-N-306, P.34-35

Remarks: CERCLA, 1100-EM-1 OPERABLE UNITS, GROUNDWATER MONITORING WELLS

Method of Shipment: HAND CARRY

Sample Identification

MW-9-7	DOUBLE-LINED PLASTIC BAG	
MW-9-8	" "	"
MW-9-9	" "	"

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
Steve L Anderson / STEVE L ANDERSON	J W Lindberg J W LINDBERG	1-22-90 3:48PM
Relinquished by:	Received by:	Date/Time:
J W Lindberg J W LINDBERG	R G Alexander R G ALEXANDER	1-23-90 / 0605
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9211-37-1

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: Steve Anderson (Golder Assoc.) Date Sampled: Jan 5-19, 1990 Time: NA hours

Company Contact JW Lindberg Telephone (206) 376-8005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-9-4	double-lined plastic bags	Soil	Particle Size
MW-9-5	" " " "	Soil	Particle Size
MW-9-6	4 split spoon liners	Soil	Permeability, Particle size, Atterberg L.
MW-9-7	double-lined plastic bag	Soil	Particle Size, Atterberg L.
MW-9-8	" " " "	Soil	Particle Size
MW-9-9	" " " "	Soil	Particle Size

Field Information **

Special Handling and/or Storage Do not allow MW-9-6 to freeze

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

Bldg. Well #9-4 Date 1-5-87

Released By [illegible]
Operational Health Physics

Remarks

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. WELL #9-5 Date 01-06-90

Released By S. Boyd
Operational Health Physics

Remarks <D β-γ & on out-side of bag.

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-6 Date 1-8-90

Released By M Copeland
Operational Health Physics

Remarks
1 silt sample

MW-9-6

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-7 Date 1-18-90

Released By M Copeland
Operational Health Physics

Remarks
1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-8 Date 1-18-90

Released By M Copeland
Operational Health Physics

Remarks
1 Sample

54-3000-022 (09/88)

RADIATION RELEASE

Bldg. MW-9-9 Date 1-18-90

Released By M Copeland
Operational Health Physics

Remarks
1 Sample

54-3000-022 (09/88)

9212[illegible]73